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1: EMBO J 1992 Oct;11(10):3521-31

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A mammalian dual specificity protein kinase, Nek1, is related to the NIMA cell cycle regulator and highly expressed in meiotic germ cells.

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Screening of mouse cDNA expression libraries with antibodies to phosphotyrosine resulted in repeated isolation of cDNAs that encode a novel mammalian protein kinase of 774 amino acids, termed Nek1. Nek1 contains : N-terminal protein kinase domain which is most similar (42% identity) to the catalytic domain of NIMA, a protein kinase which controls initiation of mitosis in Aspergillus nidulans. In addition, both Nek1 and NIMA have a long, basic C-terminal extension, and are therefore similar in overall structur Despite its identification with anti-phosphotyrosine antibodies, Nek1 contain sequence motifs characteristic of protein serine/threonine kinases. The Nek1 kinase domain, when expressed in bacteria, phosphorylated exogenous substrates primarily on serine/threonine, but also on tyrosine, indicating that Nek1 is a dual specificity kinase with the capacity to phosphorylate all three hydroxyamino acids. Like NIMA, Nek1 preferentially phosphorylated beta-casein in vitro. In situ RNA analysis of nek1 expression in mouse gonads revealed a high level of expression in both male and female germ cells, with distribution consistent with a role in meiosis. These results suggest that Nek1 is a mammalian relative of the fungal NIMA cell cycle regulator.

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